OPERATING INSTRUCTIONS

for the

HSE PLUGSYS® MiniCase
Type 609

(Version 1.2 / printed: June 2010 from Serial. No. 96001 Hel.)

NOT FOR HUMAN USE
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Foreword

These Operation Instructions describe the functions and the use of the PLUGSYS MiniCase Type 609 developed and manufactured by HUGO SACHS ELEKTRONIK - HARVARD APPARATUS GmbH. The description must always be read in conjunction with the Operating Instructions of the modules installed in the MiniCase.

The description of a technical product can never be really complete and can not cover all possible applications. Please address any queries to the dealer from whom you have purchased the equipment, or directly to HUGO SACHS ELEKTRONIK - HARVARD APPARATUS GmbH using the reply form at the end of these Operating Instructions.

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All the information in these Operating Instructions has been assembled after careful evaluation but does not represent a warranty of product properties. In addition, we reserve the right to introduce changes in line with technical progress.

Copyright

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General description

The housing series PLUGSYS MiniCase Type 609 is intended as case and power supply for PLUGSYS measuring and computing amplifiers. The small housing MiniCase is a low-cost and space-saving alternative for 1 or 2 modules and allows PLUGSYS measuring and computing amplifiers to be used as conventional stand-alone units. Unlike the PLUGSYS housings Type 601 and 603, the MiniCase has no system bus as feed-in for power supply and as internal signal link between the individual modules. For this reason the MiniCase systems are supplied by HUGO SACHS ELEKTRONIK - HARVARD APPARATUS GmbH individually wired up and configured to suit the actual requirements. Because of the absence of an internal system bus and the limitation to 2 modules the MiniCase is only suitable for use with certain modules or module combinations as shown in the chart at the end of the product description. The chart also provides details on any MiniCase extensions which may be required: Options 01 to 06.

Standard specification of the MiniCase

- ABS plastics housing, flame-resistant to UL94VO, colour RAL 7032 (stone grey), with ventilation slots at the sides.
- Modular power supply 85 - 264 V AC (40 Watt), output voltage 5 V DC (5 A) and ±12 V DC (0.5 A) for supplying PLUGSYS modules.
- 3-pin IEC mains input socket combination with fuse and mains switch on the back of the housing.
- Suitable for taking front panels of 16E max. width (1E = 5.08 mm), total 81.3 mm.

MiniCase Options

Add-on options to the standard PLUGSYS MiniCase 609 are available to meet individual requirements. The options in your equipment are shown on the equipment label.

Option 01  Wider case through internal straps, extra width 9E (1E = 5.08 mm) corresponding to 46 mm. The case can then take front panels up to 25E, corresponding to 127 mm.

Option 02  Power supply with additional +24 V (1.6 A) output.

Option 03  Carrying handle for secure transport in mobile use.

Option 04  4 BNC sockets on the back of the unit for signal inputs or outputs.

Option 05  Empty MiniCase housing without power supply and mains input, to take non-electrical PLUGSYS modules, such as Gas Select Module GSM Type 671/4.

Option 06  Standard power supply to meet the requirements for clinical applications.

Hazards in operation

Through the use of a power supply conforming to the international regulations for equipment safety there is no electrical hazard when operating the equipment. If however the equipment is damaged through inappropriate use, falling off the bench or ingress of moisture and dirt it is essential that its safety and functionality is checked by a properly qualified technician.
List of equipment supplied

Check that the shipment is complete and undamaged. The equipment consists of the MiniCase with mains supply cable and the PLUGSYS modules installed in it, together with their Operating Instructions and accessories.

Before starting to work with your new equipment please check the information on the label that the supply voltage required to operate the MiniCase agrees with your local supply. If you have any doubts in this regard please ask a technician in your organisation, the dealer from whom you have purchased the equipment, or HUGO SACHS ELEKTRONIK - HARVARD APPARATUS GmbH directly.

Choice of location

The MiniCase should be arranged readily accessible on your work bench. Please note that moisture, heat, direct sunlight or dirt can severely detract from the function and the life of the equipment. There is also a danger that the MiniCase can be wrenched off the bench through unsuitably arranged connection cables or mains supply cable (trip-up trap).

Assembling the equipment

Connect the MiniCase to the mains supply using the mains supply cable enclosed. The mains switch is located at the back of the equipment above the mains cable input connector. Further details on the PLUGSYS modules installed in the MiniCase are given in the module Operating Instructions enclosed.

In order to reduce interference between the measurement electronics and the supply to a minimum it is important that the two cable systems are physically separated and never run parallel to each other. The cables should be secured to the experimental setup in order to ensure constant ambient measurement conditions.

The blank 4 mm banana socket on the front of the MiniCase can be used as earth for larger metal structures, e.g. laboratory stands. This avoids hum interference on the measurement signals due to the 50/60 Hz supply.

Maintenance

Any traces of salt solution should be removed immediately with a cloth in order to avoid corrosion damage on the metal parts, the controls and the electronics.

For cleaning the front panel, controls and connecting cable never use scouring powder or cleaning agents which tend to dissolve plastics.

Any dust should be removed with a lint-free cloth or a fine dust brush.

Serious dirt can be removed with soapy water or a conventional mild domestic detergent, using a soft cloth. Then wipe off with clear water. Never allow any liquid to pass into the equipment or into the switches and sockets.

Spots on the aluminium front panel can readily be removed using an ordinary plastic pencil rubber.

The interior of the equipment does not require any servicing or cleaning.
### PLUGSYS module information chart

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module name</th>
<th>Type number</th>
<th>Can module be used?</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC</td>
<td>Analog Digital Converter Module</td>
<td>664</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>BI</td>
<td>Bus Interface Module</td>
<td>657</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>BLM</td>
<td>Bus Link Module</td>
<td>680</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>BPA</td>
<td>Bio Potential Amplifier Module</td>
<td>675</td>
<td>yes</td>
<td>no combination with IPH 5000 Type 675/1 possible</td>
</tr>
<tr>
<td>CFBRA</td>
<td>Carrier Frequency Bridge Amplifier</td>
<td>677</td>
<td>yes</td>
<td>no unfiltered output only with option 04</td>
</tr>
<tr>
<td>DBA</td>
<td>DC Bridge Amplifier</td>
<td>660</td>
<td>yes</td>
<td>no unfiltered output only with option 04</td>
</tr>
<tr>
<td>DIF</td>
<td>Differentiator Module</td>
<td>664</td>
<td>yes</td>
<td>no MAX and MIN output only with option 04</td>
</tr>
<tr>
<td>DM</td>
<td>Display Module</td>
<td>667</td>
<td>no</td>
<td>--- technically possible but not useful</td>
</tr>
<tr>
<td>DVM</td>
<td>Digital Voltmeter Module</td>
<td>666</td>
<td>yes</td>
<td>no digital display of static values, e.g. from DBA</td>
</tr>
<tr>
<td>ECGA</td>
<td>ECG Amplifier</td>
<td>689</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>EEGA</td>
<td>EEG Amplifier</td>
<td>690</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>EFM</td>
<td>Electromagnetic Flowmeter Module</td>
<td>693</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>EIM</td>
<td>External Input Module</td>
<td>670</td>
<td>no</td>
<td>--- technically possible but not useful</td>
</tr>
<tr>
<td>EMGA</td>
<td>EMG Amplifier</td>
<td>691</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>EMM</td>
<td>Electrometer Module</td>
<td>696</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>FM</td>
<td>Flow Measurement Module</td>
<td>662</td>
<td>yes</td>
<td>no requires LLC module Type 661 and Option 01</td>
</tr>
<tr>
<td>GSM</td>
<td>Gas Select Module</td>
<td>671/4</td>
<td>yes</td>
<td>Option 05 empty housing without power supply</td>
</tr>
<tr>
<td>HRM</td>
<td>Heart Rate Module</td>
<td>669</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>LLC</td>
<td>Liquid Level Controller</td>
<td>661</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>MEA</td>
<td>Micro Electrode Amplifier</td>
<td>695</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>MMM</td>
<td>Max Min Module</td>
<td>668</td>
<td>yes</td>
<td>no input via Option 04 or second module, e.g. DBA</td>
</tr>
<tr>
<td>ODM</td>
<td>Output Driver Module</td>
<td>672</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>OPPM</td>
<td>Oxygen Partial Pressure Module</td>
<td>697</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>PCU</td>
<td>Plethysmograph Control Unit</td>
<td>687</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>PDM</td>
<td>Pressure Distribution Module</td>
<td>671/5</td>
<td>yes</td>
<td>Option 05 empty housing without power supply</td>
</tr>
<tr>
<td>PHDA</td>
<td>Peak Height Detector Amplifier</td>
<td>683</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>pHMM</td>
<td>pH Measurement Module</td>
<td>694</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>PPCM</td>
<td>Perfusion Pressure Control Module</td>
<td>671</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>PRM</td>
<td>Pressure Regulator Module</td>
<td>671/3</td>
<td>yes</td>
<td>Option 05 empty housing without power supply</td>
</tr>
<tr>
<td>PSM</td>
<td>Programmable Stimulator Module</td>
<td>676</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>QM</td>
<td>Quotient Module</td>
<td>679</td>
<td>yes</td>
<td>no inputs via Option 04 or second module</td>
</tr>
<tr>
<td>ROM</td>
<td>Recorder Output Module</td>
<td>670</td>
<td>no</td>
<td>--- not useful</td>
</tr>
<tr>
<td>RRM</td>
<td>Respiration Rate Module</td>
<td>684</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>RWT</td>
<td>R.Wave Trigger Module</td>
<td>689/1</td>
<td>yes</td>
<td>no only usable together with ECG amplifier Type 689</td>
</tr>
<tr>
<td>SSM</td>
<td>Signal Subtraction Module</td>
<td>692</td>
<td>yes</td>
<td>no inputs via Option 04 or second module</td>
</tr>
<tr>
<td>STOM</td>
<td>Software Trigger Output Module</td>
<td>688</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>TARM</td>
<td>Thermal Array Recorder Module</td>
<td>682</td>
<td>yes</td>
<td>yes requires Option 01 wider housing</td>
</tr>
<tr>
<td>TCM</td>
<td>Timer Counter Module</td>
<td>686</td>
<td>no</td>
<td>---</td>
</tr>
<tr>
<td>TMM</td>
<td>Temperature Measurement Module</td>
<td>678</td>
<td>yes</td>
<td>no signal output probe 1 to 4 via Option 04</td>
</tr>
<tr>
<td>TTFM</td>
<td>Transit Time Flowmeter Module</td>
<td>700</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>VCM</td>
<td>Ventilation Control Module</td>
<td>681</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>VSM</td>
<td>Ventilation Sequencer Module</td>
<td>698</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

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Option 01 = wider MiniCase
Option 02 = power supply with additional output 24 V (1.6 A)
Option 04 = 4 additional BNC outputs on back of housing
Option 05 = empty MiniCase without power supply

- = module can not be used or combination not useful
Conformity

This product and accessories conform to the requirements of the Low-Voltage Directive 73/23/EWG as well as the EMC Directive 89/336/EWG and are accordingly marked with the CE symbol.

Technical Data PLUGSYS MiniCase Type 609

Construction 2-part flame-resistant ABS plastics housing conforming to UL94VO, colour RAL 7032 (stone grey), with ventilation slots in the sides of both housing shells.

Number of modules and width The MiniCase provides a maximum width for 16 units (16E, 1E = 5.08 mm, 16E = 81.3 mm). With PLUGSYS modules of 8E standard width a MiniCase can take two modules. Under certain conditions it is possible to fit 3 modules (internal straps, Option 01).

Supply Supply 85 - 264 V AC (40 Watt) with automatic supply voltage adjustment and interference suppression to EN 55022 graph B. The standard module supply is 5 Volt (5 A) and ±12 Volt (0.5 A).

Option 1 Internal straps expand the housing by 9 width units (9E, 1E = 5.08 mm), corresponding to 46 mm. The total width available is then 25E corresponding to 127 mm.

Option 2 Additional power supply module with 24 Volt (1.6 A) output. This increases the maximum power consumption of the MiniCase to 80 Watt.

Option 3 Carrying handle for secure transport in mobile use.

Option 4 4 additional BNC sockets on the back of the unit for signal inputs or outputs.

Option 5 Empty MiniCase housing without power supply, to take non-electrical PLUGSYS modules, such as Gas Select Module GSM Type 671/4. This reduces the housing width to 105 mm.

Option 6 Module power supply to meet the requirements for clinical applications to IEC 601 / RN 60-601 and UL544.

Dimensions Width 160 mm (option 01 = 206 mm), height 160 mm, depth 250 mm

Weight 2 kg approx. with one average PLUGSYS module

Accessories Mains supply cable and Operating Instructions
Please take a few minutes of your time in order to write to us on any difficulties in understanding the Operating Instructions or in the use of the apparatus. With your feedback you will help to improve our products and the system documentation and make them more user-friendly.

Please tell us

- where you have found mistakes,
- where the arrangement was not clear and what you did not understand,
- and where you would like to see improvements.

Many thanks for your kind assistance.
Yours HUGO SACHS ELEKTRONIK-HARVARD APPARATUS GmbH.

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Town
Phone/Fax
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